



The Role of Teachers in the Implementation of 21st Century Skills at Primary School

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ABSTRACT

This study aims to describe the role of teachers in implementing 21st-century skills among primary school students in grades 1 through 6 at SD YPK Ebenheiser Asbaken, Sorong Regency. The research adopts a qualitative approach with a descriptive method. Data were collected through observation, questionnaires, and interviews with six classroom teachers and the school principal. Six students, one representative from each grade, also participated as informants. Data analysis followed the stages of data reduction, data presentation, and conclusion drawing. The results reveal that teachers at SD YPK Ebenheiser Asbaken have implemented the six dimensions of 21st-century skills, namely critical thinking, creative thinking, communication, collaboration, technology use, and social interaction. Teachers in the lower grades (grades 1 to 3) have partially integrated these skills, with critical thinking and communication being most prominent. Teachers in the upper grades (grades 4 to 6) demonstrate a more comprehensive application of all six dimensions. The school principal actively supports the implementation by guiding teachers and promoting a 21st-century learning environment despite limited facilities and a remote school location. This study contributes empirical evidence

on 21st-century skill implementation in geographically isolated primary schools in eastern Indonesia, with implications for teacher professional development and curriculum policy.

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INTRODUCTION

The 21st century presents a complex and multidimensional set of challenges for education, particularly at the primary school level. Students today are required to develop competencies that extend far beyond academic mastery, encompassing critical thinking, creative thinking, communication, collaboration, technology use, and social interaction (Trilling & Fadel, 2009; Redhana, 2019). These six competencies have been widely recognized as essential for enabling individuals to navigate an increasingly interconnected and technology-driven world. The role of the teacher is, therefore, central to ensuring that these competencies are cultivated effectively within the classroom context.

The growing influence of technology and information on education compels teachers to continuously develop their own skills and adapt their pedagogical practices. Sanjaya (2013) identifies several key roles that teachers must fulfill in the 21st-century learning environment: as a source of knowledge, facilitator, classroom manager, demonstrator, guide, motivator, and evaluator. These roles collectively define a teacher who is not merely a transmitter of information but an active agent in the learning process who empowers students to become independent, critical, and creative thinkers (Hariyanto & Jannah, 2020). Wagner (as cited in Budiyanti et al., 2020) further articulates this through his formulation of the “Seven Survival Skills for the 21st Century,” which encompasses critical thinking and problem-solving, cross-network collaboration, agility and adaptability, initiative and entrepreneurship, information access and analysis, effective communication, and curiosity and

imagination.

Empirical evidence from Indonesia and internationally underscores the urgency of implementing 21st-century skills at the primary school level. Septikasari & Frasandy (2018) identify the 4C framework (critical thinking, creative thinking, communication, and collaboration) as foundational competencies within primary education. Similarly, Noptario et al. (2024) assert that in the era of the Merdeka Curriculum, teachers must take a more proactive and adaptive role in strengthening students' 21st-century competencies. Studies have also shown that challenges such as limited infrastructure, resource constraints, and geographic isolation can impede the full implementation of these skills, particularly in remote areas (Muthmainnah et al., 2023; Nuraini et al., 2024).

SD YPK Ebenheiser Asbaken, located in Sorong Regency, West Papua, represents precisely the type of school that faces these contextual challenges. Based on observations conducted on 17 July 2023, the researcher found that 21st-century skill practices had begun to be implemented, primarily in grades 4 through 6, yet not all students had fully internalized the expected competencies. This observation prompted a deeper investigation into the extent to which teachers at this school have fulfilled their roles in implementing the six dimensions of 21st-century skills across all grades from 1 to 6. Mahanal (2014) argues that teachers are indispensable to the emergence of a generation equipped with 21st-century competencies; their professional commitment and instructional quality directly shape the cognitive and social development of students.

This research is significant not only for classroom practitioners and school administrators but also for pre-service teachers and educational policymakers, particularly those working in geographically isolated regions of eastern Indonesia. The findings contribute empirical evidence on the current state of 21st-century skill implementation in primary schools in underprivileged settings, providing a basis for targeted professional development and policy intervention. The study poses the central research question: to what extent have

Teachers at SD YPK Ebenheiser Asbaken, Sorong Regency, implemented 21st-century skills in their respective classrooms.

METHODS

This research employed a qualitative approach with a descriptive method. Moleong (2012) defines qualitative research as an inquiry that seeks to understand phenomena as experienced by research subjects, including behavior, perceptions, motivations, and actions, presented descriptively through words and language within a specific natural context and utilizing various natural methods. Creswell (2013) further elaborates that qualitative research involves methods to explore and understand the meanings that individuals or groups ascribe to social or human problems, entailing the collection of specific data from participants, inductive analysis from particular to general themes, and the interpretation of data meanings.

A descriptive method was adopted in accordance with Sugiyono's (2012) conceptualization of descriptive research as a method that functions to describe or provide a depiction of an object or phenomenon based on collected data, without making inferences or generalizations beyond the scope of the study. This approach was considered appropriate given that the primary purpose of the study was to describe and document, in a systematic and comprehensive manner, the conditions, behaviors, and experiences of teachers and students in relation to 21st-century skill implementation.

Research Participants and Setting

The research was conducted at SD YPK Ebenheiser Asbaken, Sorong Regency, West Papua Province, Indonesia. The research subjects comprised six classroom teachers (Grades 1 through 6) and one school principal. In addition, six students, one representative from each grade, were selected as informants to capture students' perspectives on their teachers' practices. Purposive sampling was used to select research subjects based on their direct relevance to the research objectives.

Data Collection

Data collection was conducted through three instruments: (1) observation of learning activities both inside and outside the classroom; (2) a structured questionnaire distributed to student representatives from each grade to gauge their perceptions of their teachers' implementation of 21st-century skills; and (3) written and verbal interviews with all six classroom teachers and the school principal. Observations and student questionnaire administration were conducted across three consecutive days, commencing on 16 November 2023. The school was formally notified on 15 November 2023.

Data Analysis

Data analysis followed the interactive model proposed by Miles and Huberman, comprising three stages: data reduction, data presentation, and conclusion drawing or verification (Djam'an & Aan, 2013). In the data reduction stage, the researcher selected and focused on data relevant to the research objectives, discarding peripheral information. In the data presentation stage, the data were organized into descriptive narrative accounts that allowed for structured interpretation. Conclusions were drawn based on consistent patterns identified across the multiple data sources and verified against the theoretical framework.

RESULTS AND DISCUSSION

Result

The data collection process at SD YPK Ebenheiser Asbaken was initiated on 15 November 2023 with the submission of the research letter to the school administration. Formal data collection commenced on 16 November 2023, with the research subjects comprising five classroom teachers, one school principal, and six students as respondents for the questionnaire. Each of the six students represented one grade level, from Grade 1 to Grade 6.

On the first day of data collection, questionnaires were distributed to three students representing Grades 1, 2, and 3 (the lower grades). On the second day, questionnaires were administered to three students from Grades 4, 5, and 6 (the upper grades). The purpose of this distribution was to ascertain student

perceptions of their teachers' implementation of 21st-century skills across the school. On the third day, structured written interviews were conducted with all six classroom teachers and the school principal.

The analysis of questionnaire responses from Grade 1 students revealed that the six dimensions of 21st century skills, namely critical thinking, creative thinking, communication, collaboration, technology use, and social interaction, had not yet been fully applied. This was attributable to the developmental stage of these students, who are categorized as lower-grade learners. Critical thinking and communication emerged as the two most dominant skills observable in Grade 1. A similar pattern was identified in the Grade 2 questionnaire data, where the same two dimensions were most prominently practiced, while the remaining four were applied only partially.

Analysis of the written interviews with all six classroom teachers indicated that each teacher had implemented, to varying degrees, the six dimensions of 21st-century skills in their respective classrooms. Some classes exhibited students who remained relatively passive, while others demonstrated more active student engagement. Several teachers reported that a portion of their students had already begun to independently apply certain 21st-century skills. The school principal corroborated these findings, confirming that the school had progressively introduced 21st-century skill practices and that the principal actively guided teachers in this endeavor, despite the school's remote location and limited facilities.

Discussion

The findings of this study confirm that teachers at SD YPK Ebenheiser Asbaken have begun to fulfill their roles in implementing 21st-century skills, albeit with variations across grade levels. For students in the lower grades (Grades 1 through 3), the full internalization of all six dimensions remains a developmental aspiration rather than a present reality. This is consistent with Redhana's (2019) argument that 21st-century skills must be cultivated progressively and that their mastery is commensurate with students' cognitive and social development. The prominence of critical thinking and

Communication in the lower grades reflects the foundational nature of these skills, which can be introduced even in early childhood education contexts (Stanikzai, 2023).

For students in the upper grades (grades 4 through 6), the study found a more comprehensive and observable implementation of all six 21st-century skill dimensions. This aligns with the developmental trajectory posited by Trilling and Fadel (2009), who emphasize that upper primary school students possess the cognitive readiness to engage more fully with higher-order thinking and collaborative tasks. The findings also corroborate Nuraini et al. (2024), who demonstrate that project-based learning and other student-centered approaches, which are frequently employed by more experienced upper-grade teachers, effectively foster 21st-century competencies.

With regard to the teacher's role, the data from the written interviews with classroom teachers reflect a teaching force that is increasingly aware of and committed to its multidimensional responsibilities. The roles articulated by Sanjaya (2013), namely as knowledge source, facilitator, classroom manager, demonstrator, guide, motivator, and evaluator, were all identifiable across the teaching practices described by the participants. This is further supported by Hariyanto and Jannah (2020), who argue that teachers in the 21st century must serve as both facilitators and motivators, helping students access information from diverse sources through technology. The present findings suggest that even in geographically isolated schools with limited resources, teachers can and do fulfill these roles when sufficiently guided and supported by school leadership.

The school principal's role in supporting the implementation of 21st-century skills emerged as a critical enabler in this study. The principal's commitment to guiding teachers, developing a shared understanding of 21st-century pedagogy, and maintaining high standards despite contextual limitations reflects the attributes of effective educational leadership described by Purwanto (2020). Berlier (as cited in Purwanto, 2020) identifies three core functions of educational professionals: planning, implementation and

management, and assessment. All three functions were discernible in the principal's leadership practice at SD YPK Ebenheiser Asbaken.

These findings carry important implications for professional development programs targeting primary school teachers in remote areas of eastern Indonesia. The study underscores that teacher competence in 21st-century pedagogy is not merely a function of resource availability but is fundamentally shaped by the quality of instructional leadership and the school's organizational culture. Noptario et al. (2024) similarly contend that teacher professional development within the Merdeka Curriculum framework must be contextualized and responsive to the specific challenges and assets of local educational environments. The present study provides a contextually grounded exemplar of this principle in practice at the primary school level in Sorong Regency.

CONCLUSION

This study concludes that teachers at SD YPK Ebenheiser Asbaken, Sorong Regency, have actively implemented the six dimensions of 21st-century skills across all grade levels. In the lower grades (Grades 1 to 3), implementation is partial, with critical thinking and communication being the most consistently practiced dimensions. In the upper grades (Grades 4 to 6), implementation is more comprehensive, with students demonstrating greater engagement across all six dimensions. Classroom teachers have fulfilled their roles as facilitators, motivators, knowledge sources, and evaluators, while the school principal has provided indispensable leadership support that enables the progressive realization of 21st-century pedagogy despite the school's geographic isolation and limited facilities.

The findings highlight the critical importance of instructional leadership and ongoing teacher guidance in enabling effective 21st-century skill implementation in remote primary schools. Future research is recommended to examine the longitudinal impact of targeted professional development programmes on teachers' capacity to implement 21st-century skills in similar

settings, and to explore how technology-enhanced learning strategies can be adapted to the contextual constraints of schools in Eastern Indonesia.

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Declarations

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REFERENCES

- Agustin, M., & Pratama, Y. A. (2021). Keterampilan berpikir dalam konteks pembelajaran abad ke-21 (N. F. Atif, Ed.). PT Refika Aditama.
- Budiyanti, dkk. (2020). Guru pembelajar, bukan guru biasa. Sahabat Pena Kita.
- Creswell, J. W. (2013). Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.). SAGE Publications.
- Daryanto, & Karim, S. (2017). Pembelajaran abad 21. Gaya Media.
- Djam'an, S., & Aan, K. (2013). Metodologi penelitian kualitatif. Alfabeta.
- Hariyanto, A., & Jannah, U. (2020). Revolusi guru dalam pembelajaran abad 21. SIGMA: Jurnal Pendidikan Matematika, 5(2), 77-84. http://ejournal.unira.ac.id/index.php/jurnal_sigma/article/view/771

- Huda, N., Rusli, M., Friska, S. Y., Kadiyo, K., Pratama, F. G., & Saman, S. (2024). The cooperative learning type of team games tournament (TGT): Its application to mathematics learning in primary schools. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 9(1), 1588-1599. <https://doi.org/10.23969/jp.v9i1.11415>
- Irnanda, E. F. (2024). Analisis peran guru dalam pembelajaran abad 21 pada siswa sekolah dasar melalui kurikulum merdeka. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 9(1), 2250-2263. <https://doi.org/10.23969/jp.v9i1.11739>
- Mahanal, S. (2014). Peran guru dalam melahirkan generasi emas dengan keterampilan abad 21. Paper presented at the Seminar Nasional Pendidikan HMPS Pendidikan Biologi FKIP Universitas Halu Oleo, Sulawesi Tenggara, Indonesia. <https://www.researchgate.net/publication/319746366>
- Moleong, L. J. (2012). *Metodologi penelitian kualitatif (edisi revisi)*. Remaja Rosdakarya.
- Muthmainnah, A., Pertiwi, A. D., & Rustini, T. (2023). Peran guru dalam mengembangkan keterampilan abad 21 siswa sekolah dasar. *Jurnal Ilmiah Wahana Pendidikan*, 9(4), 41-48.
- Noptario, N., Rizki, N., Nur'aini, N., & Ningrum, E. C. (2024). Peran guru dalam kurikulum merdeka: Upaya penguatan keterampilan abad 21 siswa di sekolah dasar. *Ideguru: Jurnal Karya Ilmiah Guru*, 9(2), 656-663. <https://doi.org/10.51169/ideguru.v9i2.813>
- Nuraini, N., Yuliana, R., Tisnasari, S., & Setiawan, S. (2024). Implementasi keterampilan abad 21 melalui pembelajaran berbasis proyek di SDN 1 Sukaraja. *Jurnal Pendidikan Dasar*, 12(1), 97-113. <https://doi.org/10.46368/jpd.v12i1.1538>
- Pada, D., Rusli, M., & Jumadi, J. (2025). Critical pedagogy in social studies education: Empowering students through democratic dialogue. *Journal La Edusci*, 6(6), 1285-1296. <https://doi.org/10.37899/journallaedusci.v6i6.2730>
- Putri, R., Nursalim, M., Rahmasari, D., Rusli, M., Yulia, N. M., Qurbani, G., & Putri, R. A. R. (2025). Mapping minds: A comprehensive review of metacognition and executive function in elementary science learning. *Jurnal Penelitian Pendidikan IPA*, 11(11), 75-85. <https://doi.org/10.29303/jppipa.v11i11.13102>
- Redhana, I. W. (2019). Mengembangkan keterampilan abad ke-21 dalam pembelajaran kimia. *Jurnal Inovasi Pendidikan Kimia*, 13(1), 2239-2253.
- Redhana, I. W., & Liliarsari. (2008). Program pembelajaran keterampilan berpikir kritis pada topik laju reaksi untuk siswa SMA. *Jurnal Forum Kependidikan*, 27(2), 103-112.

- Rusli, M., & Yasmin, F. (2024). Improving basic process skills of science through character education of integration learning based on discovery learning model. *Indonesian Research Journal on Education*, 4(4), 1082-1086. <https://doi.org/10.31004/irje.v4i4.1073>
- Rusli, M., Nursalim, M., Rahmasari, D., Putri, R., Wardana, M. D. K., Putri, R. A. R., & Yulia, N. M. (2025). Cognitive processing and neurodevelopmental perspectives on misconceptions in elementary science education: A comprehensive analysis. *Jurnal Penelitian Pendidikan IPA*, 11(11), 86-97. <https://doi.org/10.29303/jppipa.v11i11.13003>
- Sanjaya, W. (2013). Strategi pembelajaran berorientasi standar proses pendidikan. Kencana.
- Septikasari, R., & Frasandy, R. N. (2018). Keterampilan 4C abad 21 dalam pembelajaran pendidikan dasar. *Jurnal Tarbiyah Al-Awlad*, 8(2), 107-117.
- Stanikzai, M. I. (2023). Critical thinking, collaboration, creativity and communication skills among school students: A review paper. *European Journal of Theoretical and Applied Sciences*, 1(5), 441-453. [https://doi.org/10.59324/ejtas.2023.1\(5\).34](https://doi.org/10.59324/ejtas.2023.1(5).34)
- Sugiyono. (2012). Metode penelitian kuantitatif, kualitatif dan R&D. Alfabeta.
- Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J. M., Morisseau, T., Bourgeois-Bougrine, S., Vinchon, F., El Hayek, S., Augereau-Landais, M., Mourey, F., Feybesse, C., Sundquist, D., & Lubart, T. (2023). Creativity, critical thinking, communication, and collaboration: Assessment, certification, and promotion of 21st century skills for the future of work and education. *Journal of Intelligence*, 11(3), 54. <https://doi.org/10.3390/jintelligence11030054>
- Trilling, B., & Fadel, C. (2009). 21st century skills: Learning for life in our times. Jossey-Bass/John Wiley & Sons.
- Van Laar, E., Van Deursen, A. J., Van Dijk, J. A., & De Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, 72, 577-588. <https://doi.org/10.1016/j.chb.2017.03.010>